

Annual Nat. Park Service
m. m. m. 743

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
Bryce Canyon National Park, Utah

November 25, 1952

ANNUAL REPORT OF FOREST PROTECTION

AND FOREST INFESTATION

BRYCE CANYON NATIONAL PARK, UTAH

1952

General.

A drought of two years duration was broken by the heavy winter snows of 1951 - 52. 225 inches of snow fell between December 1, 1951 and November 15, 1952. This fact accounted for the revival of streams, springs and water storage in general. The growth of grasses and perennials was the heaviest in many years. The overall picture was one of forest and range recovery. Although summer rains were only average, the year long precipitation yield was excellent, being 50% higher than 1951.

Weather Summary.

	<u>1952</u>	<u>1951</u>
Maximum temperature	88	91
Minimum temperature	-20	-12
Mean maximum	71.4	72.5
Mean minimum	17.9	10.5
Mean	49.6	41.5
Total precipitation (December 1, 1951 - Nov. 15, 1952)	18.55"	12.74"
Total snowfall (December 1, 1951 - Nov. 15, 1952)	225.0 "	65.5 "

Fire Occurrence.

Two small lightning fires were detected and suppressed during 1952. Both fires were caused by lightning and caused negligible damage.

Fire No. 1 was located in upper Willis Creek and suppressed at a total cost of \$33.95. Fire No. 2 was near the Yovimpa truck trail road and suppressed at a cost of \$19.21.

RX - INT File Copy

LIBRARY FILE

Fire Prevention.

Regular inspections were made of the Government and Concessioner properties and facilities. Constant patrols were made by the members of the protection staff of the forested rim road and a systematic night patrol of heavy use areas was maintained. Regular fire drills were conducted by the Concessioner brigade.

Fire Presuppression.

The fire equipment was maintained in readiness from June 1 until November 15. October and early November were extremely dry and range or forest fires were ever possible.

On May 26 a Forest Service; National Park Service and Utah Cooperative Firefighters forest fire training session was held. 53 men were in attendance and given two phases of training. The morning was devoted to training films and visual aid charts and the afternoon to crew problems in the field.

On June 23, 135 Utah Parks employees were given instructions on fire prevention and suppression.

Fire weather index readings began on May 29 and continued until the close of September.

Summary of Fire Danger Days

Year	Class I	Class II	Class III	Class IV	Class V	Total
1952	12	28	77	5	0	122

Number of Lightning Storms Recorded

1952 - - - 39

Protection Improvements.

The Utah Parks Company repaired the water line from Shaker and Trough Springs to the company storage tanks. With a number of small alterations in the distribution system this move provides an assured winter supply to the National Park Service. While pressure and supply remain inadequate for heavy fire suppression, it is a big step forward. Formerly it was necessary to rely on a small well, or to haul water by tank truck. This deficiency seems to be corrected. The first flow of gravity water by the new system reached Park Headquarters November 12, 1952.

Electric ranges and hot water heaters have been installed in quarters numbers 23, 24 and 26. These installations remove much of the fire danger that existed when hazardous and obsolete heating equipment was formerly used.

Fire Equipment Acquisition.

No new equipment received.

Protection Improvement Needs.

1. Adequate water storage and distribution system.
2. Fire cache. New and separate building.
3. F. M. radio system.
4. Replacement of old telephones. Rebuilding of present ground telephone line.

Campgrounds.

The auto campground received heavy use during all periods of favorable weather.

It was signally apparent that the most prominent deficiency was the lack of suitable space for house trailers. Trailers are increasing in numbers and especially in size. The spurs designed in 1933 - 38 are woefully small and badly arranged to accomodate trailers of 30 feet in length, or longer.

Fuel.

Fuel wood for the auto campground and service needs remains in abundant supply.

Wood Utilization.

All logs cut by forest pest control projects and visible to the primary road system and vista traveler were salvaged as well as the logs within reasonable reach. 50,000 Board feet of logs were hauled to the Pearson and Crofts sawmill on stores account for milling.

Grazing.

There have been no significant changes in the grazing problem. A meeting of the East Fork Cattle Grazers Association held in Tropic, Utah on March 8 was attended. The Association agreed in principle with District Forest Ranger P. Max Rees on the proposal to withhold stock from the upper units of the East Fork until July 1.

Beef stock came off the ranges in prime condition this year. Heavy slumps in beef prices were noted as early as September.

Wildlife.

The porcupine damage problem was studied in the field on August 11 by the following officials: Chief Forester L. F. Cook, Regional Forester S. T. Carlson, Assistant Regional Director Hugh M. Miller, Biologist Victor Cahalane, and Assistant Superintendent John G. Lewis. Study plots have been laid out and steps are being taken to ascertain the extent of the damage and patterns of new damage for possible control measures.

Mule deer seem to be flourishing in numbers and condition, despite an extremely heavy winter. Reduction by the 1952 hunting season was light due to open and dry weather.

Reforestation.

No work in this category during 1952.

Forest Research.

Dr. J. L. Mielke issued a formal report on the limb rust fungus on January 16, 1952. This report deals chiefly with inoculation of pines and germination tests of Aeciospores.

Forest Pathologist J. L. Mielke, accompanied by Mr. J. Whitney Floyd, State Forester-Fire Warden for Utah, visited Bryce Canyon National Park July 7 - 10 in connection with the former's studies on the rust fungus Cronartium filamentosum in Ponderosa pine stands. Aecial production (spore sacs) is considerably greater this year than last. The pycniospore stage, which precedes the aeciospores by one year, was found for the first time this year in the Park and vicinity. This stage, on naturally infected pines, was not known until this spring when Mr. Frank Hawksworth, an assistant of Dr. Lake S. Gill of the Division of Forest Pathology, discovered it on the South Rim of Grand Canyon. The pycniospores are an important stage in the life history of the rust. The pycniospores are produced in tiny amber-colored droplets of a sticky fluid about the size of a pin head. At Bryce Canyon these were found to occur only sparingly. It is suspected that weather conditions are a factor in the production of the pycniospores.

Forest Insects.

The first forest insect control project for 1952 began on May 14. Heavy winter snows persisted in the forest until late May. This fact, coupled with cold weather, delayed fading and survey work on the Black Hills beetle control work.

Summary of May-June 1952 control work.

<u>Tree Type</u>	<u>Insect controlled</u>	<u>No. of trees treated</u>
Ponderosa pine	Black Hills beetle	208

Cost Summary.

<u>Account No. 821.</u>	<u>Object classification.</u>	<u>Allotment</u>	<u>\$2,000.00</u>
	03.3 Personal services	1,184.00	
	02.2 Travel	18.00	
	07 Contractual services and rentals	163.09	
	08 Supplies & materials	88.62	
	15 Taxes & assessments		
	F.I.C.A.	9.65	
	Total cost of project - -	\$1,463.36	

208 trees treated. Unit cost per tree \$7.03.

At the conclusion of the spring control period a serious outbreak of bark beetles was apparent in the vicinities of Long Hollow and Cougar Ridge. Regional Forester S. T. Carlson examined the infestation on June 30 and requested and received an additional allotment of Control funds in the amount of \$1,500.00. Work was initiated on July 1.

Summary of costs, Black Hills beetle control work in Long Hollow, Whiteman Bench, Merrill Hollow, and head of Swamp Canyon, July 1 - 22. Account No. 821.2.

	<u>Allotment</u>	<u>\$1,500.00</u>
03 Personal services	928.99	
07 Rents and utility services	104.30	
08 Supplies & materials	155.30	
Total - - - - -	\$1,187.59	

Number of trees treated	296
Cost per tree	\$4.01
Number of acres in treatment area	160

A balance of \$312.42 is available to be carried over for 1953 spring control work.

R. J. Washburn, Forest Entomologist, U.S.D.A., Ogden, Utah, using a spotting crew of five men, made a strip survey of all of the heaviest Ponderosa pine stands in the Park during October. The survey was for Black Hills beetles and should produce some valuable information for pest control requirements and recommendations for 1953.

White Fir Needle Miner Control.

The White fir needle miner (*Epinotia meritana*) which has been epidemic in varying stages of intensity on Whiteman Bench since 1945 was again treated in 1952. Spraying of 1,000 acres in the heaviest White fir stands was accomplished in the years of 1947, 1948 and 1949. Recommendations for a 1952 spraying were made by Senior Entomologist Leslie J. Orr, U.S.D.A. and concurred in by Regional Forester S. T. Carlson on May 28, 1952. The original estimate was as follows:

Rental of Aeroplane and pilot	\$1,250.00
Insecticide	2,925.00
Labor for loading crew, loading crew truck rental, miscellaneous costs	500.00
	<hr/>
	\$4,675.00

Arrangements were made for the project to be initiated as soon as adults or White fir needle miner moths were at an optimum point of emergence. On June 4, 1952, 2500 gallons of D.D.T. was purchased and on site on Monday June 16, 1952.

Invitations to bid for flying service were advertized on May 13, 1952 with closing date May 27, 1952. The contract was awarded to Aeromotive Pest Control Company, Midvale, Utah on July 7. The bid was in the amount of \$1,250.00.

Actual operations got under way on July ⁹~~11~~ - 12 when regular employees Wesley Dennett and Raymond D. Pollock made a roadside treatment of two applications of D.D.T. solution with the Buffalo Mist Blower.

The contractor-pilot arrived on July ¹¹10 and began flying at 4:00 a.m. on July 12. Chief Ranger James B. Felton; Entomologists Leslie J. Orr and R. J. Washburn, U. S. D. A., were observers. Loading crew members were: Park Ranger J. L. Crawford supervisor; Wesley Dennett and Raymond D. Pollock crewmen.

Flights were made under good conditions. Curley Adams, the pilot contractor, gained the approval of Mr. Orr to use Aerosol for extra efficiency in settling and dispersal of the insecticide.

Flights by Time and Load

July 12, 1952

<u>Load</u>	<u>Gallons</u>	<u>Out</u>	<u>In</u>
1	100	5:35 a.m.	6:08 a.m.
2	100	6:12 a.m.	6:50 a.m.
3	100	7:08 a.m.	7:40 a.m.
4	100	7:50 a.m.	8:15 a.m.
5	100	8:27 a.m.	8:55 a.m.
6	100	9:05 a.m.	9:30 a.m.
Total		600 gallons	

Evening spray, with buffalo mist blower, with 50 gallons D.D.T. and 20 gallons of mixture #269 added to test lethal quality.

Flights by Time and Load

July 13, 1952

<u>Load</u>	<u>Gallons</u>	<u>Out</u>	<u>In</u>
1	100	5:30 a.m.	6:00 a.m.
2	100	6:10 a.m.	6:35 a.m.
3	100	6:45 a.m.	7:07 a.m.
4	100	7:25 a.m.	7:45 a.m.
5	100	7:55 a.m.	8:15 a.m.
6	100	8:35 a.m.	9:05 a.m.
7	100	9:15 a.m.	9:40 a.m.
8	100	9:55 a.m.	10:20 a.m.
Total		800 gallons	

No evening flights - - turbulence.

Flights by Time and Load

July 14, 1952

<u>Load</u>	<u>Gallons</u>	<u>Out</u>	<u>In</u>
1	100	5:50 a.m.	6:00 a.m.
2	100	6:35 a.m.	6:55 a.m.
3	100	7:05 a.m.	7:30 a.m.
4	100	7:40 a.m.	8:05 a.m.
5	100	8:15 a.m.	8:40 a.m.
6	100	8:50 a.m.	9:15 a.m.
Total		600 gallons	

At the close of the flight No. 6 on July 14, the terms of the contract had been fulfilled. Senior Entomologist Leslie J. Orr recommended that the project should be performed continuously, rather than in two applications because of the intensity of needle miner moth emergence. Request was made to the office of the Park Superintendent for exercise of the 25% increment flying service cost for the spraying of 500 gallons of insecticide. This request was granted and an additional purchase order in the amount of \$312.50 was prepared.

Flights by Time and Load

July 15, 1952

<u>Load</u>	<u>Gallons</u>	<u>Out</u>	<u>In</u>
1	100	5:30 a.m.	6:07 a.m.
2	100	6:15 a.m.	6:45 a.m.
3	100	6:55 a.m.	7:20 a.m.
4	100	7:25 a.m.	7:55 a.m.
5	100	8:10 a.m.	8:40 a.m.
<hr/> Total		500 gallons	

Summary for cost of project:

821.01.3	Personal Services	330.54
821.04.1	Telephone call	.30
821.07	Equipment Rental	77.20
821.07	Contractual Services	1,562.50
821.08	Supplies & Materials	2,925.00
Total cost - - - - -		<u>\$ 4,895.54</u>

Muslin trays were erected at irregular intervals from the northern reaches of Whiteman Bench to Rainbow Point by R. J. Washburn for study of the moth kill. These trays were examined by Forester Ratcliff and Assistant Superintendent Lewis on July 15. It was observed that an unusually great number of adult moths were in flight. This was the greatest saturation of insecticide this area has received. Mr. Washburn made a field survey of the needle miner infestation on November 6. He will issue a formal report of his findings, which should give further evidence of the efficacy of the aerial and Buffalo mist blower sprayings.

Mountain Tent Caterpillar Control. Allotment \$100.00.

On June 9 Park Ranger W. T. Krueger, with an assistant, sprayed the entire headquarters roadside area for tent caterpillars. The Buffalo mist blower was used and under ideal spraying conditions, the application was most successful as practically no hatch of caterpillars took place in June and July in the treated areas.

Tree Diseases.

As a result of field observations and recommendations by Regional Forester S. T. Carlson, Senior Forest Pathologist Lake S. Gill, U.S.D.A., made a survey of the dwarf mistletoe infection in the Ponderosa pine stands of Bryce Canyon in September, 1951. Dr. Gill recommended control work on 600 acres with initial measures to be taken in early 1952. Accordingly plans were made and completed for the transfer of specialized equipment from Grand Canyon National Park which arrived in early July, 1952. The project got under way July 22 and continued until October 3, 1952.

The majority of the control work was accomplished in the northern half of section 1, township 37 south, range 4 west and the southern one half of section 36, township 36 south, range 4 west.

The poisoning crew moved through the entire control area killing all trees which could not be saved or salvaged. This operation covered one hundred and eighty six acres and included strips one through seventeen.

The pruning and slash disposal, which completed the control work, progressed through strip seven. A total of seventy eight acres were covered by this operation in the area.

Work was also completed on the infected trees between the Park Service residence area and the Utah Parks Company Lodge.

The following is a break-down of the number of trees treated by the Mistletoe Control Project for the year 1952:

	<u>Cut</u>	<u>Pruned</u>	<u>Poisoned</u>
Mature (30" D.B.H. and over)	51	75	44
Large intermediate (15" to 30" D.B.H.)	82	457	2376
Small intermediate (4½" to 15" D.B.H.)	401	651	2171
Sapling (4½" D.B.H. to 6' high)	379	255	146
Reproduction (6' high and under)	359	46	-
Totals - - - - -	1272	1484	4737

Total trees treated - - - - - 7493

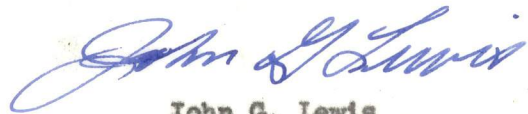
Total cost of the Mistletoe Control Project for 1952 is as follows:

Personal Services	\$3,497.90
Equipment Rental	342.29
Total - - - - -	\$3,840.19

The poisoned trees were checked frequently and there has been no indication of any attack by either Ips or the Rocky Mountain Bark Beetle.

Several experimental plots were laid out in the Mistletoe Control Area by Plant Pathologist Frank Hawksworth. The location of these plots and the method with which they should be handled is on file in this office.

Some experimental trees have also been selected. These trees have been marked with yellow paint and carry a metal tag showing the number of each individual tree. A list of these trees is on file in this office with instructions on how they should be treated.



John G. Lewis
Assistant Superintendent
Bryce Canyon National Park

Approved for Distribution:

Paul R. Franke, Superintendent,
Zion and Bryce Canyon National Parks

cc: Director (1 copy)
Regional Director (2 copies)
Zion Office (1 copy)



UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 WASHINGTON

Bryce Canyon National Park

(Name of national park or monument)

1952 Annual Forest Insect Report

Name of plant species attacked	Name of attacking insect	Infestation				Opening and closing dates for control	Control			Estimated total cost next year
		Location	Extent	Damage	Status		Treatment			
							Last year	This year	Next year	
1	2	3	4	5	6	7	8	9	10	11
Ponderosa pine	Black Hills beetle	All Park lands	Widespread	killed	Endemic	May 25 - July 15	405	504	350	\$2,100.00
White fir	Epinotia meritana	Whiteman Bench	Heavy in spots	Killed	Endemic	June 15 - July 20	None	1,000 acres		

Date or period of survey **Estimate December 5, 1952**Unit of survey **Rim of Canyon over Park**

(Park at large, ranger district, biological control unit)

Method of survey _____
(General observations, systematic examination by campgrounds, strips, plots, watersheds, tree census, or otherwise)

Submitted by _____

John G. Lewis
Asst. Supt.Date **December 5, 1952**

INSTRUCTIONS FOR PREPARING REPORT

The report is due not later than November 1 of each year for the preceding 12-month period. If surveys in different control units or ranger districts within a park or monument are made by different individuals, each individual shall make out one of these forms, together with an accompanying narrative report.

Distribution of copies:

- Original: Regional Director, attention Regional Forester.
- One copy: Director, attention Chief of Forestry.
- One copy: Entomological Field Representative, Bureau of Entomology and Plant Quarantine.
- One copy: Park or monument files.

This report is to be supplemented with a detailed narrative report in accordance with the attached outline and also with a map showing the location of any new infestation or infestations of epidemic proportions.

All infestations within a park are to be reported on one sheet, unless additional space is needed, except the following:

1. Infestations of epidemic proportions, which should be reported on separate sheets.
2. Surveys made by different individuals, which should be reported by each individual on separate sheets.
3. Surveys made by ranger districts or biological control units which should be reported on separate sheets for each ranger district or biological control-unit concerned.

EXPLANATION OF COLUMN HEADINGS

1. State scientific and/or common name or names of tree, shrub, or other plant species attacked by the insect.
2. State scientific and/or common name of the insect, if known. If unknown, so state, and indicate its general type, whether bark beetle, borer, defoliator, leaf miner, gall aphid, budworm, twig pruner, etc.
3. Indicate whether infestation is general throughout the park or restricted to certain stated areas. Reference the site of the infestation to geographical or cultural features that are commonly known and named on the official map of the park. Examples are: Summit of Beech Knob; Battery 5; Tuolumne Meadows; Shirttail Canyon; Whitman Creek; Camp-ground No. 12; etc.
4. If infestation is limited or confined to a few scattered trees, state number of trees attacked. If restricted to roadsides, state miles of same affected. If widespread state acreage and average number of trees per acre attacked.
5. Indicate severity of damage caused by the infestation. State whether trees are killed, dying, weakened, defoliated, or otherwise injured by the insect as a primary cause.
6. State whether infestation is a new or old one. If old indicate whether it has increased, decreased, or remained the same since last year.
7. State approximate opening and closing dates of applied control.
8. State what treatment was applied last year, if any, and to what extent it was responsible for any change indicated in column 9.*
9. State what treatment was applied this year, if any, and to what extent it appears to have been effective.*
10. State what treatment is recommended for next year, if any.*
11. Indicate approximate cost in man-days and materials separately of treatment recommended under column 10.

* Give exact formula of any sprays or chemicals used or recommended, or indicate S. F. number as listed in Tree Preservation Bulletin No. 6. State also date or dates of application.

U. S. GOVERNMENT PRINTING OFFICE 6-9921



LIBRARY FILE 118848